DCCUMENT RESUME

ED 049 751 JC 710 129

AUTHCR Starkweather, Ann, Comp.
TITLE Instructional Objectives for a Junior College Course in Intermediate Algebra.
INSTITUTION California Univ., Los Angeles. ERIC Clearinghouse for Junior Coll. Information.
PUB DATE Jun 71
NOTE 13p.

EDRS PRICE EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS *Algebra, *Behavioral Objectives, *Junior Colleges, *Mathematics, *Mathematics Instruction

ABSTRACT

These instructional objectives have been selected from materials submitted to the Curriculum Laboratory of the Graduate School of Education at UCLA. Arranged by major course goals, these objectives are offered simply as samples that may be used where they correspond to the skills, abilities, and attitudes instructors want their students to acquire. These objectives may also serve as models for assisting instructors to translate other instructional units into specific measurable terms. For other objectives in related courses see: ED 033 683 (College Algebra); ED 033 678 (Calculus and Analytic Geometry); ED 033 698 (Geometry); JC 710 120 (College Mathematics); and JC 710 130 (Introduction to Mathematical Thinking). (MB)

ED049751

U.S. DEPARTMENT OF HEALTH, EDUCATION
& WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

Instructional Objectives for a Junior College Course in Intermediate Algebra

Ann Starkweather, Compiler

ERIC Clearinghouse for Junior Colleges
University of California
Los Angeles, California

June 1971

JC 710 129

UNIVERSITY OF CALIF.
LOS ANGELES

JUN 1 1971

CLEARINGHOUSE FOR
JUNIOR COLLEGE
INFORMATION

Unit I - The Real Number System

1. Concept: The real numbers as they compare to counting numbers and the rationals

   Objective: In fifty words or less, the student will define real number, differentiating it from the counting numbers and the rationals. (100%)

2. Concept: Laws governing the real number system

   Objective: Given ten operations of the reals, the student will justify nine of them, stating which laws are being used.

   Objective: The student will cite an example of a number system in which one of the above mentioned laws is violated. (70%)

3. Concept: Set Theory

   Objective: Given ten terms basic to the understanding of set theory, the student will define each in fifteen words or less. (90%)

   Objective: Given three descriptions of sets, the student will correctly translate each of them to set theory notation. (100%)

4. Concept: Operations with signed numbers

   Objective: Given ten problems in the addition and subtraction, multiplication and division of signed numbers, the student will correctly solve eight of them.

5. Concept: Grouping symbols

   Objective: Given five problems involving a large number of grouping symbols, the student will correctly simplify four of them.

6. Concept: Evaluating algebraic expressions

   Objective: Given six algebraic expressions with their respective variable values, the student will correctly evaluate five of them.

Unit II - Products and Factoring

1. Concept: Multiplication of a multinomial by a monomial

   Objective: Given ten problems involving the multiplication of a multinomial by a monomial, the student will correctly solve eight of them.

2. Concept: Factoring a multinomial, each term of which having a common factor

   Objective: Given five multinomials, the terms of each each having common factors, the student will correctly factor four of them.

   Objective: In fifty words or less, the student will explain the inverse relationship between concepts 1 and 2 above. (80%)

3. Concept: Multiplying the sum of two quantities by the difference of the same two quantities

   Objective: Given five indicated products of the sum and difference of the same two quantities, the student will correctly multiply four of them.

4. Concept: Factoring the difference of squares

   Objective: Given five expressions of the difference of squares form, the student will correctly factor four of them.

   Objective: In fifty words or less, the student will explain the inverse relationship between concepts 3 and 4 above. (80%)

5. Concept: Factoring quadratic trinomials

   Objective: Given ten quadratic trinomials, the student will correctly factor seven of them.

6. Concept: Factoring by grouping

   Objective: The student will factor four of five given expressions by the grouping method.

Unit III - Rational Algebraic Operations

1. Concept: Rational numbers

   Objective: In fifty words or less, the student will define the rationals, differentiating them from the real numbers and the integers. (100%)

2. Concept: Reducing fractions

   Objective: Given ten algebraic fractions, the student will reduce nine of them.

   Objective: In fifty words or less, the student will explain the equivalence relation between a fraction and its reduced form. (60%)

3. Concept: Multiplication and division of fractions

   Objective: Given five pairs of algebraic expressions, the student will correctly multiply and divide four of them.

4. Concept: Lowest common multiple

   Objective: The student will find the lcm of four of five given sets of four or five numbers each.

5. Concept: Addition and subtraction of fractions

   Objective: The student will correctly add and subtract four of five given pairs of algebraic expressions.

6. Concept: Complex fractions

   Objective: Given five complex fractions, the student will simplify four of them.

Unit IV - First Degree Equations and Inequalities

1. Concept: The notion of equality

   Objective: In twenty words or less, the student will explain the difference between identity and equality. (100%)

   Objective: In twenty words or less, the student will define solution set. (100%)

2. Concept: Equivalent equations

   Objective: In twenty words or less, the student will define equivalent equations and cite an example. (80%)

3. Concept: Set symbolism for first degree equations

   Objective: Given four first degree equations, the student will correctly solve two of them using set theory notation only.

4. Concept: Fractional equations

   Objective: Given five fractional equations, the student will correctly solve four of them by first clearing them of fractions.

5. Concept: Literal equations

   Objective: The student will solve four of five given literal equations.

6. Concept: Inequalities

   Objective: In fifty words or less, the student will define trichotomy and state its significance. (70%)

   Objective: The student will prove two of the four inequality theorems.

   Objective: Given three linear inequalities, the student will plot two correctly.

   Objective: In twenty words or less, the student will define absolute value. (90%)

7. Concept: Word problems (classical)

Objective: Given five classical word problems, the student will correctly solve two.

Unit V - Exponents and Radicals

1. Concept: Laws governing the exponents of quotients, products, and roots.

   Objective: The student will prove three of the six basic laws of exponentiation.

2. Concept: Roots of numbers

   Objective: The student will define in twenty words or less each of the following: square root, cube root, radical, radicand, index, and order. (80%)

3. Concept: Fractional exponents

   Objective: The student will simplify four of five given expressions involving fractional exponents.

4. Concept: Scientific notation

   Objective: Given five numbers, the student will write four of them correctly in scientific notation.

   Objective: In fifty words or less, the student will explain the value in using scientific notation as opposed to writing a number in its customary form. (70%)

5. Concept: Simplifying radicals

   Objective: Given five algebraic expressions under radical signs, the student should be able to simplify four of them by extracting quantities from the radical.

6. Concept: Multiplication of radicals

   Objective: Given five sets of two or more algebraic expressions involving radicals, the student will take four of them and multiply the two or more expressions together for each, without violating the laws of exponentiation.

7. Concept: Division of radicals

   Objective: Given five sets of two or more algeb-

raic expressions involving radicals, the student will take four of them and divide the expressions for each, without violating the laws of exponentiation.

8. Concept: Equations involving radicals

Objective: Given ten equations involving radicals, the student will solve and check eight of them.

9. Concept: Imaginary numbers

Objective: In fifty words or less, the student will define imaginary number and differentiate it from a real number. (100%)

Objective: In fifty words or less, the student will give the motivation behind the invention of the imaginary number. (100%)

Objective: The student will simplify nine of ten given expressions involving negative quantities under the radical sign.

Unit VI - Functions and Graphs

1. Concept: Ordered pair

   Objective: In fifteen words or less, the student should be able to define ordered pair, distinguishing it from a set of two elements. (100%)

   Objective: Given five sets of ordered pairs, the student will correctly plot four of them in the Cartesian plane.

2. Concept: Relation

   Objective: In twenty words or less, the student should be able to define relation, and give a geometric interpretation. (90%)

3. Concept: Function

   Objective: In twenty words or less, the student will define function. Within fifty words, the student will explain the relationship between a function and its graph. (100%)

4. Concept: Graphs of linear functions

   Objective: Given five linear functions in one unknown, the student will plot four of them. Given the graphs of five linear functions in one unknown, the student will determine the functions of four of them.

5. Concept: Graphs of first degree inequalities

   Objective: Given five first degree inequalities, the student will correctly plot four of them.

Unit VII - Quadratic Equations

1. Concept: Incomplete quadratic equations

   Objective: Given five incomplete quadratic equations, the student will correctly solve four of them.

2. Concept: Solving quadratics by factoring

   Objective: The student will solve four of five given quadratic equations by factoring.

3. Concept: Solving quadratics by the quadratic formula.

   Objective: The student will solve four of five given quadratic equations using the quadratic formula.

4. Concept: Forming a quadratic equation from its roots

   Objective: Given the roots of three quadratic equations, the student will correctly determine two of the equations.

Unit VIII - Exponential and Logarithmic Functions

1. Concept: Definition of the exponential and logarithmic functions

   Objective: In one hundred words or less, the student will define the exponential and logarithmic functions, explaining the inverse relationship between the two. (70%)

2. Concept: Use of logarithmic tables

   Objective: Given ten numbers, the student, with the aid of tables, will compute the log and antilog of seven of the given numbers.

Unit IX - Systems of Equations

1. Concept: Solving systems of equations in two variables

   Objective: Given ten systems of equations in two variables, the student will solve eight, four by the addition and subtraction method, and four by the substitution method.

2. Concept: Graphs of systems of linear equations

   Objective: The student will solve four of five given systems of linear equations graphically.

Unit X - Ratio, Proportion, and Variation

1. Concept: Definition of ratio, proportion, direct variation, and inverse variation

Objective: In twenty words or less, the student will define each of the above terms. (100%)

Objective: The student will solve four of five given problems involving direct and inverse variation.